Survival of Patients Discharged to Long Term Care

Abstract:

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Abstract
Data on the life expectancy of elderly people in long term care facilities will be important for effective service planning and monitoring quality of care. To date there are no such data from an Irish perspective. A random sample of patients discharged to long term care between Jan 1st 1997 and December 31st 2003 from a single Dublin hospital was studied. Death by January 1st 2005 was ascertained through the register of births deaths and marriage. Median survival was calculated and factors associated with mortality were determined in a logistic regression. Mean (sd) age was 82 (11) years and 61 (29%) were female. Median survival was 30.3 (95%CI 22.4-45.0) months (mean Irish life expectancy at this age is about 78 months). Three factors were independently associated with death by 2 years: age (Odds ratio 1.11 [95%CI 1.05-1.17, F ratio 15.1, p=0.0001] per year), male gender (Odds ratio 1.52 [95%CI 1.05-3.68, F ratio 5.2, p=0.024]) and discharge to continuing care (Odds ratio 1.96 [1.05-3.68, F ratio 4.4, p=0.037]). These results (which are the first such Irish data) show that patients discharged to long term care are a frail group with a reduced life expectancy. Encouragingly survival for this cohort (25% at 1 year) was similar to that seen in other countries. Data on nursing home survival will allow more accurate planning of long term residential services and help monitor quality of care.

Introduction

While Ireland has one of the youngest populations in Europe the proportion of people aged 65 years and over in Ireland is projected to grow by over 600,000 over the next 30 years with the proportion aged 80 years and over growing by 250%[1]. As increasing age is a strong predictor of institutionalisation[2] the number of older people requiring long term care can be expected to increase significantly. Data on the life expectancy of elderly people in nursing homes is important for effective service planning and has been used in monitoring quality of care[3,4]. To date there are no such data on hospital in-patients discharged to nursing homes from an Irish perspective. The present study was performed to examine the survival of a retrospective cohort of patients discharged to nursing homes from a single Dublin teaching hospital over a 7 year period between 1997 and 2003.

Methods

All in-patients referred for long term care from St. Jamesâ s Hospital are seen by the Medicine for the Elderly department and only patients deemed suitable are accepted. These patients have had their details recorded in a compterised database (Filemaker Pro) since 1/1/1997. All details relating to their geriatric assessment and subsequent discharge status are recorded. The name and nature (i.e. high dependency continuing care, public or private facility) of the nursing home the patient is ultimately discharged to is also recorded. In addition St. Jamesâ s hospital has a small number of on-site continuing care beds for high dependency patients who are deemed too medically complex for discharge away from the hospital campus. Days of delayed discharge was calculated as the interval between the patient being put on the long term care list and being discharged to a nursing home.

Between January 1st 1997 and 31st December 2003 1,552 patients were discharged to nursing homes from St. Jamesâ s Hospital. For the purposes of this study a random sample of 210 patients was selected from the total (a cohort of 30 per year between 1997 and 2003). The primary outcome measure was patient mortality status (i.e.alive or dead) on the 1st of January 2005. Patient details were obtained from the database. Several sources were used to obtain follow up information on the randomised patients. These were the nursing home section of the regional health authority, direct contact with the long-term care facility the patient was discharged to, the patientsâ hospital records and the General Register Office for births, deaths and marriages. A comparison between the sample and the whole database is shown in Table 1 and it can be seen that were no significant differences.

Missing data: Complete data was available on 195 (93%) of the patients. Fifteen patients (7%) were no longer at the long-term care facility at the time of contact but had not been registered dead within Ireland by 1/1/2005 and were treated as alive for the purposes of this study.

Median time to death was calculated for each annual cohort for which greater than 50% of the sample had died and for this overall period also (i.e. 1997-2000 cohort). Ninety five percent confidence intervals for the median were calculated by the method of Altman[5]. A Kaplan-Meier survival curve was plotted for this period also (it was restricted to the longest observation period that all subjects had in common: for the 1997-2000 cohort this was 1460 days). Univariate comparison between survivors and non survivors at 2 years (this interval was chosen to maximise power) was carried out with parametric and non parametric tests as appropriate. Analysis was restricted to subjects who had been discharged more than 2 years by 1/1/2005 (i.e. 180 subjects from the 1997 through 2002 cohorts). Days of delayed discharge was log transformed for all analyses. A logistic regression was then carried out to investigate determinants of survival at 2 years in a multivariate manner. Death by 2 years was the dependent measure and age at discharge, gender, year of discharge, days of delayed discharge and discharge status (i.e. analysed by creating 2 dummy variables â Complex Continuing careâ and â Private nursing homeâ with public nursing home being used as the reference group) as the explanatory variables. The model was reduced in a backwards stepwise fashion until only significant variables remained. All statistical tests were 2 sided and alpha = 0.05.

Results
One hundred and twenty patients (57%) had died by January 1st 2005 and outcomes are shown in table 2. Median survival was calculable for the 1997 to 2000 cohorts and is also shown in Table 2. It varied form 572 to 1364 days with an overall median for the 1997-2000 period of 951 (95% CI 681-1369) days (i.e. 30.3 [22.4-45.0] months). Of note mean life expectancy for an Irish person aged 82 is 67 months for a man and 85 months for a woman[6]).

A Kaplan-Meier survival curve for the 1997-2000 cohort is shown in Figure 1. It can be seen that mortality was initially quite rapid (e.g. 7% dead by 30 days) but slowed down over time (e.g. 13% by 90 days, 17% by 183 days and 25% by 365 days). An analysis of survivors versus non survivors was then carried out. Univariate comparisons are shown in Table 3 and it can be seen that those still alive were younger by about 3.5 years at the time of initial listing and were less likely to be discharged to continuing care.

Figure 1 Survival after discharge to a nursing home from St Jamesâ s hospital between 1997 and 2000

The proportion of the sample discharged to private nursing homes increased significantly over time (23/90 [25.6%] from 1997-99 cohort compared to 67/120 [55.8%] from 2000-3 cohort Chi2 19.4 2 df pd0.0001). Lastly a logistic regression was carried out to look at derminants of mortality at 2 years in a multivariate fashion. Three factors were independently associated with death by 2 years: age (Odds ratio 1.11 [95%CI 1.05-1.17, F artio 15.1, p=0.0001] per year), male gender (Odds ratio 1.52 [95%CI 1.05-3.68, F ratio 5.2, p=0.024]) and discharge to continuing care (Odds ratio 1.96 [1.05-3.68, F ratio 4.4, p=0.037]). Discharge to a private versus public nursing home bed [F ratio 2.59, p=0.11] was not significantly associated with mortality at 2 years though it must be noted that disability was not measured and therefore could not be controlled for.

Discussion
This is the first Irish data examining survival in older hospital in-patients discharged to nursing homes. The median life expectancy of 30 months was less than half than would be seen in the community reflecting the medical frailty of such patients. The results show that mortality for this cohort (25% at 1 year) was similar to that seen in other countries. For example one year mortality in two American cohorts during the 1990â s was 33%[7] and 35%[8] and for two English cohorts was 18%[9] and 33%[10]. The factors associated with increased mortality in the current study (i.e. age, male sex and greater medical co-morbidity requiring discharge to high dependency continuing care) were also similar to those seen in the other cohorts[7-10].

A strength of the study is the inclusion of cohorts from seven successive years allowing initial study of temporal trends. As this period was associated with increasing privatisation of nursing home care in the Greater Dublin area it is encouraging to note that there was no significant association between survival and public / private status of nursing home. It must be pointed out however that the study was not powered to address this issue and also that disability was not measured so the possibility that patients with differing severity were cared for by different nursing home types cannot be excluded. Previous research from other countries including the United States, Canada and the United Kingdom has shown that public nursing homes are associated with more complex cases[11], higher staffing levels[12], better quality of care indicators[13] and less hospitalisation for pneumonia and dehydration14 suggesting they may be more appropriate for more frail patients. The higher mortality in patients discharged to high dependency complex care in this study supports the need for this type of care (which is not routinely available at all hospitals). Determining the types of patients who are most suitable for discharge to different types of nursing homes is a complex process that is worthy of further study.

Better data on survival of patients sent to long term care will allow more accurate planning of long term residential services. It will also act as a baseline against which initiatives to delay or prevent future nursing home admission can be measured. As risk entry to a nursing home is associated with financial (e.g. house ownership) and social (e.g. access to services) as well as health care factors15,16 it is important that such data are recorded also.

In order for results to be used generally it is important that data be collected from all Irish regions and ideally by all hospitals discharging patients to long term care and for all nursing home patients accepting such patients. A core requirement of nursing home care should be the ongoing collection of patient information related to quality of care. Linking nursing home payments to patient assessment, both on admission to a nursing home and at regular intervals throughout patient stay is a feasible way to ensure accurate data collection. This approach has proved successful in the United States, not only in terms of improved data collection but also in terms of improved quality of care processes such as reduced use of physical restraint and indwelling urinary catheters17. A better knowledge of outcomes among patients discharged to long term care is required if we are to improve and ensure ongoing quality of care.

References

1. CSO, Population and Labour Force Projections 2006-2036. 2002, Dublin: Stationery Office.
2. Breeze, E., A. Sloggett, and A. Fletcher, Socioeconomic and demographic predictors of mortality and institutional residence among middle aged and older people: results from the Longitudinal Study. J Epidemiol Community Health, 1999. 53: 765-74.
3. Bravo, G., et al., Relationship between regulatory status, quality of care, and three-year mortality in Canadian residential care facilities: a longitudinal study. Health Serv Res, 2002. 37: 1181-96.
4. Oâ Neill, D., A review of the deaths at Leas-Cross nursing home 2002- 2005. 2006, HSE.
5. Altman, D.G., Practical Statistics for Medical Research. 1 ed. 1991, London: Chapman & Hall.
6. CSO, Irish Life Tables 2001-2003. 2004, Central Statistics Office.
7. Flacker, J.M. and D.K. Kiely, Mortality-related factors and 1-year survival in nursing home residents. J Am Geriatr Soc, 2003. 51: 213- 21.
8. van Dijk, P.T., et al., Comorbidity and 1-year mortality risks in nursing home residents. J Am Geriatr Soc, 2005. 53: 660-5.
9. Dale, M.C., et al., Factors affecting survival of elderly nursing home residents. Int J Geriatr Psychiatry, 2001. 16: 70-6.
10. Rothera, I.C., et al., Survival in a cohort of social services placements in nursing and residential homes: factors associated with life expectancy and mortality. Public Health, 2002. 116: 160-5.
11. Wood, P. and M. Castleden, Dependency, quality and staffing of institutions for elderly people. Health Trends, 1993. 25: 97-101.
12. McGregor, M.J., et al., Staffing levels in not-for-profit and for-profit long-term care facilities: does type of ownership matter? Cmaj, 2005. 172: 645-9.
13. Hillmer, M.P., et al., Nursing home profit status and quality of care: is there any evidence of an association? Med Care Res Rev, 2005. 62: 139-66.
14. McGregor, M.J., et al., Care Outcomes in Long-Term Care Facilities in British Columbia, Canada: Does Ownership Matter? Med Care, 2006. 44: 929-935.
15. Hancock, R., et al., The effect of older peopleâ s economic resources on care home entry under the United Kingdomâ s long-term care financing system. J Gerontol B Psychol Sci Soc Sci, 2002. 57: S285-93.
16. Wang, J.J., et al., Incidence of nursing home placement in a defined community. Med J Aust, 2001. 174: 271-5.
17. Hawes, C., et al., The OBRA-87 nursing home regulations and implementation of the Resident Assessment Instrument: effects on process quality. J Am Geriatr Soc, 1997. 45: 977-85.

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